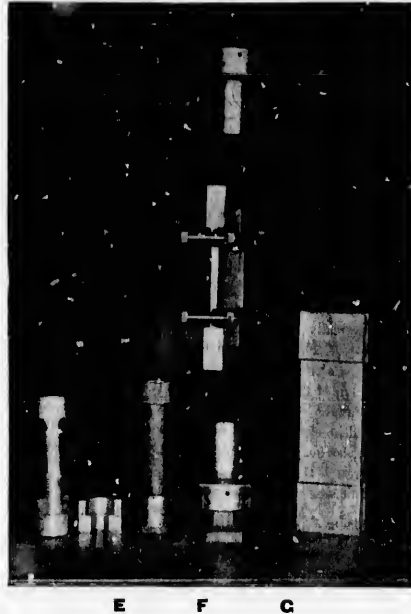Not being altogether satisfied with these results, as the test-pieces did not seem to be of sufficient size to give results which could be considered of standard practical value, new holders, with spherical seats, were designed, and are shown in Fig. F.

E   F   G

With these holders, tests can now be made upon specimens in which the shearing surface has a width of 8 ins. and a depth limited by the tensile strength of the timber, the maximum shearing area being 96 sq. inches. The web of the specimens is usually about .7 in. in thickness, so that the depth should not exceed $.35 \frac{t}{s}$, t being the tensile and s the shearing strengths in lbs. per sq. in. The depth of the shoulder forming the bearing for the pressure required to produce the shear is about $\frac{1}{2}$ inch, and is made of only sufficient sectional area to resist failure by compression, as the deeper the shoulder the greater will be the bending action introduced.

From the Tables giving the results of the shearing experiments, the following inferences may be drawn:

a. The shearing strength of the timbers is much less near the heart than at a distance from the heart.

b. Generally speaking, the shearing strength increases with the weight per cubic foot.

c. The shearing strength increases with the density of the annular rings, or rather with the proportion of hard to soft fibre.

d. A failure sometimes occurs, for which it is difficult to find a complete explanation.

For example, the two specimens from Beam X, and designated in the Table by a *, were precisely similar in dimensions and in weight, and also occupied precisely similar positions relatively to the heart in the stick from which they were cut. One of these specimens failed under a shear of 470.24 lbs. per sq. in., and the other under a shear of 301.84 lbs. per sq. in., so that the shearing strength of the latter was more than 35 per cent. less than that of the stronger specimen. A careful examination of the surfaces of fracture showed no visible difference in the specimens, and the only possible conclusion to be drawn seems to be either that one of the